

Abstract

The present invention relates a method for epitaxial growth of a second group III-V crystal having a second lattice constant over a first group III-V crystal having a first lattice constant, wherein strain relaxation associated with lattice-mismatched epitaxy is suppressed and thus dislocation defects do not form. In the first step, the surface of the first group III-V crystal (substrate) is cleansed by desorption of surface oxides. In the second step, a layer of condensed group-V species is condensed on the surface of the first group III-V crystal. In the third step, a mono-layer of constituent group-III atoms is deposited over the layer of condensed group-V species in order for the layer of constituent group-III atoms to retain the condensed group-V layer. Subsequently, the mono-layer of group-III atoms is annealed at a higher temperature. In the fourth step, bulk of the second group III-V crystal is grown with the condensed group-V layer accommodating the strain build-up which occurs during the bulk growth.